Date: Thu, 14 Jan 93 04:30:03 PST
From: Packet-Radio Mailing List and Newsgroup <packet-radio@ucsd.edu>
Errors-To: Packet-Radio-Errors@UCSD.Edu
Reply-To: Packet-Radio@UCSD.Edu
Precedence: Bulk
Subject: Packet-Radio Digest V93 #13
To: packet-radio

Packet-Radio Digest Thu, 14 Jan 93 Volume 93 : Issue 13

Today's Topics:

Send Replies or notes for publication to: <Packet-Radio@UCSD.Edu>
Send subscription requests to: <Packet-Radio-REQUEST@UCSD.Edu>
Problems you can't solve otherwise to brian@ucsd.edu.

Archives of past issues of the Packet-Radio Digest are available
(by FTP only) from UCSD.Edu in directory "mailarchives/packet-radio".

Date: 13 Jan 93 22:08:24 GMT
From: news-mail-gateway@ucsd.edu
Subject: FAQ
To: packet-radio@ucsd.edu

FAQ packet-radio

Date: 13 Jan 93 22:51:34 GMT
From: news-mail-gateway@ucsd.edu
Subject: FAQ
To: packet-radio@ucsd.edu

Hello Networkers,

I am a new subscriber in this discussion list.
I am asking for the Frequently Asked Questions to this list.

Can anyone help me to get them?

Thank you.
Khaled.

Date: 13 Jan 93 16:18:36 MDT
From: sdd.hp.com!zaphod.mps.ohio-state.edu!caen!hellgate.utah.edu!cc.usu.edu!
sltmw@network.UCSD.EDU
Subject: KISS only EPROM for TNC2 ?
To: packet-radio@ucsd.edu

> In article <01GTE98HZNYAEVNBE2@TNTECH.EDU> JRA1854@TNTECH.EDU (Jeffrey Austen)
writes:
>>Is there a reliable way to keep a TNC2 in KISS mode? Mine keeps forgetting
>>when the power fails.
>>
>>Some time ago I saw a reference to a KISS only EPROM for a TNC2, the "K3MC"
>>EPROM. I have not been able to find a source for this...does anybody know
>>where to get it?
>

Funny, I can't seem to get my TNC-2 (actually a Grief..I mean Heath HD-4040
with the TAPR upgrade) to get out of KISS. I put it in KISS mode, and I can't
for the life of me get it out...Oh well, it was a good excuse to get NOS!

--
---------------The Ex-Royal Gigolo of the House of Norwedia----------------------
  / | "I drank WHAT?"   -Socrates
  \ uper |)an |-|olmes | "I love the smell of Napalm in the morning" -Big Duke:
  /   'N7NKR' | Apocalypse Now

I'net: sltmw@cc.usu.edu sltmw@cache.declab.usu.edu   Bitnet: sltmw@usu.bitnet
----
ghazexsrcwtdceterfygtgyiy <---------sorry, just wiping the puke off my keyboard

---

Date: Wed, 13 Jan 1993 14:29:09 GMT
From: mcsun!sun4nl!star.cs.vu.nl!velschot@uunet.uu.net
Subject: packet information ?
To: packet-radio@ucsd.edu

wvogel@MtHolyoke.edu (keeper of the tone) writes:

>is it possible to moniter packet frequencies using a scanner?

>if so how do i hook-up the scanner to my pc?

>i have some packet programs now
>   ^^^^

>tnx in advance

>w

>1 xmtr shy of a station

I too would like to receive, if possible, a schematic to
an interface between a scanner/receiver and a computer,
preferably rs232 compatible.
I know it's a lot to ask, but Please, I'm going nut
listening to a signal I can't decode!!!!!
please Help!!!!!!!!!
vinny, velschot@cs.vu.nl

Date: 13 Jan 93 12:46:24 GMT
From: pacbell.com!iggy.GW.Vitalink.COM!cs.widener.edu!dsinc!netnews.upenn.edu!
prijat!triangle.cs.uofs.edu!bill@network.UCSD.EDU
Subject: TAPR 9600 baud modems
To: packet-radio@ucsd.edu

Is there anywhere on-line that I can find a description of the TAPR
9600 baud modems?? Can anyone tell me what they cost and if it is
likely that they would work with a RAMSEY 2 meter transciever??

bill   KB3YV

--

   Bill Gunshannon | "There are no evil thoughts, Mr. Reardon" Francisco
   bill@cs.uofs.edu | said softly, "except one; the refusal to think."
                       | #include <std.disclaimer.h>

Date: 13 Jan 93 20:38:11 GMT
From: pa.dec.com!engage.pko.dec.com!nntpd.lkg.dec.com!sousa.tay.dec.com!
bobseg.enet.dec.com!segrest@decwrl.dec.com
Subject: TAPR Info
To: packet-radio@ucsd.edu

I called TAPR yesterday and they were sent me some info via Internet mail. As there have been several questions about TAPR services and products during the past couple of weeks, I thought this might be of interest to others....

Bob Segrest
KD4PWU

From: 36889::"0060880@CCMAIL.EMIS.hac.com" "Robert D Nielsen" 13-JAN-1993 14:17:40.06
To: bobseg::segrest
CC:
Subj: TAPR info

Bob,

Heather Johnson said you wanted information on TAPR. Here is a copy of a file we mail out to people who inquire. Hopefully, I will get a file server going one of these days, but I think this will get the information to you in good shape. If it comes out garbled, or you need any further information, please contact me at rnielsen@tapr.ampr.org or 0060880@ccmail.emis.hac.com.

73,

Bob Nielsen W6SWE

File follows

TUCSON AMATEUR PACKET RADIO
P.O. BOX 12925
TUCSON, AZ 85732-2925
602-749-9479
FAX 602-749-5636

TAPR - What is it?

At the October 29th, 1981 meeting of the Tucson Chapter of the IEEE Computer Society the discussion turned to the then current state of the art in amateur packet radio. A week later six of the attendees gathered and discussed the feasibility of developing a Terminal Node Controller that would be complete and available to amateurs at a modest cost. This was the genesis of Tucson Amateur Packet Radio.

Their discussion led them to believe that a complete TNC, including modem and power supply, could be made available to the amateur community for approximately $125. They decided to go ahead with the project. On June 26th 1982 Lyle Johnson, WA7GXD, initiated the first TAPR built packet contact with Den Connors, KD2S.

As word of the Tucson based packet radio development effort spread around the country other pioneer oriented amateurs asked to be involved. By fall of the same year a total of 174 amateurs had committed to the project as beta testers. Evolving from their efforts was the TAPR Terminal Node Controller (now known as the TNC-1). TAPR, now formally incorporated but still manned entirely by volunteers, then made the TNC available to amateurs worldwide in kit form. Concurrently the nucleus of dedicated packeteers hit the road to demonstrate and introduce packet radio at club meetings and hamfests.

The new mode met with encouraging acceptance. The TAPR folks, now buoyed by their successful introduction of packet radio, decided to refine and improve upon their initial TNC. The product of TAPR's second development effort is now known as the TAPR TNC-2. Most TNCs now in use trace their heritage to the TAPR TNC-2.

Today TAPR continues as a membership supported non-profit research and development amateur organization. Development work is entirely by volunteers. TAPR currently has more than 1000 members, world-wide. A membership meeting is held annually in Tucson.

Membership in TAPR includes a subscription to Packet Status Register, the quarterly newsletter. PSR has been published since July 1982 and is recognized as an authoritative source for up-to-date user and technical information on packet radio. Much of the material in PSR is timeless. Back issues may be obtained from the TAPR office.

Although TAPR has licensed several commercial manufacturers to produce TNCs based on the TNC-2 design, and the complete kits are no longer available from TAPR, we do offer the TNC-2 printed circuit boards (along with a schematic diagram plus EPROM code and assembly and operation manuals on disk) for those who wish to

build their own and continue to supply several products in kit form, as well as a library of many packet radio software programs for MS-DOS computers.

The dues for membership in TAPR are $15 for one year. In Canada and Mexico dues are $18 and outside North America they are $25.

DESCRIPTIONS OF PACKET RADIO KITS AVAILABLE

TAPR PSK Modem

The TAPR PSK modem kit is designed for use with FUJI/OSCAR 12, the Microsats and JAS-1B as well as linear satellite transponder operation through OSCARs 10 and 13. In addition, it is suitable for weak-signal work on terrestrial paths.

The kit consists of three (3) printed circuit boards and all parts to populate them. It also includes cabling, connectors, LEDs, bargraph displays and switches to complete the modem. It does not include a case or power supply (it runs on 11-16 VDC). A case is available separately.

The modem requires the transmit data and a x16 or x32 clock from the TNC; it supplies RX data, RX clock and DCD to the TNC. A front panel switch bypasses the PSK modem and restores normal operation to the TNC, including radio connections.

Any TNC-1 or clone (Heathkit HD-4040, AEA PKT-1) or TNC-2 or clone (AEA PK-80, GLB TNC-2A, PacComm TNC-200, MFJ 1270/1274/1278) will interface with no problems. The PK-232 will interface easily with TAPR's modem disconnect upgrade kit. Other units may interface but have not been reported to TAPR. Units with software HDLC may not interface (GLB PK-1 series, Kantronics KPC-series and KAM for example).

The PSK modem has been tested with Kenwood, ICOM and Yaesu radios. Proper doppler shift correction tracking with ICOM units may require a simple modification to the PSK modem which is documented in the

modems instruction manual.

The TAPR PSK modem utilizes a Costas loop demodulator which has a 3 to 8 dB better performance than designs which limit the signal at the input stage. It has been extensively tested and optimized for 1200 bps operation. Other speeds are possible with changes to the input filters, but these changes are untested and undocumented.

Manchester (for satellites) as well as normal PSK transmit modes are available at the flip of a front panel switch. Doppler correction polarity (and defeat) is also switch selectable.

Front panel indicators include a LOCK LED (indicating lock to an incoming signal), signal strength bargraph and center tuning moving-dot display.

Construction requires a fine-tip soldering iron, a steady hand, two or three quiet evenings and access to a calibrated oscilloscope. A function generator or calibrated audio tone source and a Digital Volt Meter are useful but not mandatory.

Note:The PSK modem is not designed for recovery of the 400 bps non-HDLC telemetry transmissions from OSCARs 10 and 13. These transmissions are not compatible with standard packet TNCs.

TAPR 9600 BPS MODEM KIT

The TAPR 9600 bps modem is a full-duplex baseband modem compatible with the K9NG and G3RUH standards. Like these modems, it requires an interface to your radio other than via the microphone and speaker jacks. It has a 20-pin modem disconnect header which will allow a second external modem (such as the TAPR PSK modem) to optionally be connected. The 9600 bps modem will fit internally into the case of many TNCs.

It uses a 4-layer PC board for minimum noise, utilizes a transmit waveform lookup table in ROM for minimum transmit distortion, and interfaces easily to a variety of TNCs. The transmit path includes an independent

watchdog timer.

The modem selection logic correctly routes the PTT command from the TNC to prevent, for example, keying your 1200 baud radio when running 9600 bps.

The receive filter includes a compensation adjustment to tailor the modem to the radio receiver and AC-coupling to accommodate frequency drift on the channel. An improved state machine is used for clock recovery and a DCD circuit that is based on both signal quality and the presence of a signal.

It optionally includes a self-contained clock. A bit regenerator option is available for incorporating the modem into a full-duplex repeater.

PK232 MODEM DISCONNECT UPGRADE

This kit is a simple PC board assembly you can build in an evening and still have time left to operate your radio! Once completed, it simply plugs into an IC socket inside the PK232 and provides you with a "Standard" TAPR modem disconnect header (for plugging in the TAPR 9600 bps modem or PSK modem, for example) as well as a convenient place to connect the DCD State Machine upgrade kit. The result is a no-holes enhancement of your PK-232 (or Heath HK-232).

PK232MBX Installation Kit

This kit allows the owner of a PK232MBX with the "new" motherboard to install the TAPR 9600 bps modem with complete ease.

The kit consists of metal spacers and screws to mount the modem by picking up existing motherboard mounting studs inside the PK232MBX and includes a pre-wired harness to connect the 9600 bps modem to the TAPR PK232 Modem Disconnect Kit. The harness simply plugs into the 9600 bps modem at one end and the modem disconnect at the other end.

Finally, it includes a pre-wired harness that wires the modem radio port to the PK232MBX external modem port, and the control and power connections between the PK232MBX

motherboard and the 9600 bps modem.

Thus, modem installation becomes a simple "plug and play" operation, with no wiring harnesses to fabricate, no hardware to locate and no holes to drill!

NOTE: Owners of earlier PK232s with the MBX daughtercard may use the installation kit, but the prewired harness for the radio interface, power and control wires will not be compatible. These cables must be fabricated and will involve some minor work on the motherboard itself.

TNC-2 PRINTED CIRCUIT BOARD

Although TAPR has licensed the TNC-2 design to several commercial manufacturers and is no longer producing complete kits, there have been many requests for the bare printed circuit boards used in the TNC-2 by those who would like to "build their own". If operation exclusively with an external modem (such as the TAPR 9600 bps modem) is desired, it is not necessary to wire the internal 1200 bps modem portion of the board. Additionally, there are hams in many countries who have difficulty in obtaining equipment at affordable prices, but have access to parts and have expressed interest in building inexpensive TNCs. To meet these needs, TAPR is offering the TNC-2 printed circuit boards with a 5.25 in. MS-DOS format disk containing assembly and operational information and EPROM code, plus a printed schematic diagram.

METCON

METCON is a device for remote teleMETry and CONtrol. It is based on an 87C51 microcontroller and provides eight (8) inputs and eight (8) outputs.

The inputs can be used for digital monitoring (switch closures, etc.), frequency measurement (up to a few kilohertz) and pulse counting (drops from a rain gauge, etc.).

Four of the outputs are "dry-contacts" provided by normally

open reed relays. They are suitable for controlling a variety of loads and can be used to energize larger relays for power control functions. Additional output relays and their connectors are available from TAPR.

METCON includes a serial port and three (3) levels of security access. It can be connected to a TNC at a remote site and, via a shared packet-radio channel, may measure and/or control operations at the remote site. Applications that come to mind include repeater control and weather observations.

An accessory voltage-to-frequency convertor is available to convert analog signals (voltage, current, power, etc.) to a frequency in the range that METCON can read. A slightly different version of this contains a temperature sensor which allows temperature to be measured by METCON.

An 8-input ADC module is also available for voltage measurements. This does not use any of the existing eight inputs, but unlike the voltage-to-frequency converter, it shares a common ground with METCON and is therefore unsuitable for measurements where ground must be at different levels or separated from METCON by long cables.

An elapsed time pulser is available as well. This is useful for measuring things like the number of hours a transmitter has been keyed up, or how long a cooling system has been running.

THE TAPR "DCD MODS"

Background

Proper operation of Data Carrier Detect (DCD) is imperative for efficient sharing of a packet channel. Many TNCs don't provide optimum DCD operation, and the current version (2.0) of AX.25 Level 2 protocol compounds the problem. However, an inexpensive solution is now available to combat the former case and progress is being made in the latter case with proposed changes to AX.25 Level 2 Version 2.1.

The Problem

The Tucson LAN operates via a mountaintop repeater dedicated for packet use. With a radius of coverage approaching 200 miles, it is essential that all stations be able to properly detect use of the channel by other stations and defer their transmissions until the channel is clear.

Over time, it has become apparent that most modems are lacking in proper DCD operation. Some are much worse than others. Some are OK, but allow improper operator adjustment without letting the "threshold" adjustment is incorrect. (TNC-2 code releases 1.1.6 and later alert the operator by not passing along packets that are received if DCD was not activated. This encourages the operator to properly set any DCD threshold control that may be on his TNC.)

Eric Gustafson, N7CL, has done extensive investigation into this problem and presented his findings at the 7th ARRL Computer Networking Conference. It has also been published in Packet Status Register.

Solution

If the DCD decision could be made on the basis of "information coherence" rather than "is their some sort of signal or noise present?", LAN operation will improve. This premise has been demonstrated in a number of locations where modifications to TNCs have been made.

Unfortunately, the modifications involve wire-wrapping a fair bit of circuitry, and this has prevented widespread adoption of the mods.

The TAPR Board of Directors approved funding a project in early January of 1989 to provide inexpensive kits to make it a trivial matter to upgrade most TNCs to improved DCD operation. These mods are extremely useful for both VHF and HF operation.

THE 2211 DCD UPGRADE

For TNCs using the XR2211 demodulator such as:

TAPR Beta Board	GLB PK-1
TNC-1	GLB TNC-2A
TNC-2	PacComm TNC-200
Heath HD-4040	MFJ 1270
AEA PKT-1	MFJ 1274
AEA PK-80	DRSI HF*MODEM

The PC board is tiny and shaped to fit into a TNC-1 or TNC-2. After construction (an hour or so), you simply unplug the XR2211 chip from its socket, insert it into the socket on the upgrade board, then plug the upgrade board into the IC socket vacated by the XR2211 chip on the TNC.

If you are into HF operation, provision is made to connect a "Threshold" control onto the demodulator.

The result will be fast-attack, slow decay DCD with a hang time to compensate for temporary fades due to multipath. When all stations sharing a channel have proper DCD action, data flows more efficiently.

THE STATE MACHINE DCD UPGRADE

For TNCs with modems such as:

KPC-1	PacComm Tiny-2/Micro-2
KPC-4	DRSI PC*PA Type 1
KPC-2400	DRSI PC*PA Type 2
KAM	AIWA APX-25
AEA PK-87	AIWA APX-25M
AEA PK-88	TASCO TNC-20
AEA PK-232	TASCO TNC-20H
PacComm TNC-220	Heath HK-232
Heath Pocket Packet	

The upgrade adaptor for these TNCs adds an EPROM-based State Machine to derive DCD based on lockup of a digital phase-lock loop. It is a small PC board assembly that mounts easily inside the cabinet of most any TNC (NOT the Heath Pocket Packet/TASCO TNC-u21).

This upgrade will dramatically improve DCD operation, allowing you to run your radio unsquelched. This alone reduces other station's TXDelay requirements, improving channel throughput.

For TNCs with "software HDLC," a optional clock generator
may be included to provide the necessary clock
signal (KPC-1, KPC-2, HF channel of KAM).

For current pricing information on TAPR kits, contact:

Tucson Amateur Packet Radio
P.O. Box 12925
Tucson, AZ 85732-2925
602-749-9479
FAX 602-749-5636

% ====== Internet headers and postmarks (see DECWRL::GATEWAY.DOC) ======
% Received: by urc.dco.dec.com; id AA22735; Wed, 13 Jan 93 14:23:26 -0500
% Received: from hac2arpa.hac.com by decuac.DEC.COM (5.65/Ultrix-fma) id
AA24976; Wed, 13 Jan 93 14:23:24 -0500 XX
% Received: from GSGMVS.EMIS.HAC.COM ([192.27.11.14]) by hac2arpa (4.1/SMI-DDN)
id AA24354; Wed, 13 Jan 93 11:22:39 PS
% Received: from CCMAIL.EMIS.HAC.COM by GSGMVS.EMIS.HAC.COM (Soft-Switch Central
V4L380P3); 13 Jan 1993 11:57:11 GM
% Message-Id: <CCMAIL.0060880.8036.1993 0113 11 57 11 57>
% Date: 13 Jan 1993 11:57:11 GMT
% From: "Robert D Nielsen" <0060880@CCMAIL.EMIS.hac.com>
% Subject: TAPR info
% To: bobseg::segrest
% Comment: MEMO 1993/01/13 11:20

--
Bob Segrest
segrest@bobseg.enet.dec.com

Date: Wed, 13 Jan 1993 14:01:20 GMT
From: usc!howland.reston.ans.net!zaphod.mps.ohio-state.edu!sol.ctr.columbia.edu!
The-Star.honeywell.com!umn.edu!kksys.com!edgar!brainiac!moron!lmt!cgc.lmt.com!
chrisc@network.UCSD.EDU
To: packet-radio@ucsd.edu

References <930111153611.535@NSULA.EDU>,
<1993Jan12.113135.13990@biggus.moron.vware.mn.org>,
<jstark.726853484@mcshh.hanse.de>
Subject : Re: Telnet Server and KA9Q NOS 930104

In article <jstark.726853484@mcshh.hanse.de> jstark@mcshh.Hanse.DE (Jens Stark)
writes:
>From: jstark@mcshh.Hanse.DE (Jens Stark)
>Subject: Re: Telnet Server and KA9Q NOS 930104
>Date: Tue, 12 Jan 1993 15:44:44 GMT

>Sorry to be off subject, but where can i FTP the official configuration ?

>Greetings,
>   Jens

ucsd.edu: in the packet radio directory.

Chris

   Chris Cox W0/G4JEC   chrisc@lmt.mn.org
   Network Administrator
   LaserMaster Technologies   Tel: (612) 944-6069
   7156 Shady Oak Road   Fax: (612) 944-5544
   Eden Prairie, MN 55344

     ----- For mail of a more social nature, please use -----
           Internet: chrisc@moron.vware.mn.org
           Amprnet: chrisc@biggus.g4jec.tcman.ampr.org

Date: Wed, 13 Jan 1993 21:13:35 GMT
From: usc!howland.reston.ans.net!paladin.american.edu!darwin.sura.net!sgiblab!
sgigate!odin!jerber.sandiego.sgi.com!jerryb@network.UCSD.EDU
To: packet-radio@ucsd.edu

References <1993Jan9.105718.26181@qualcomm.com>, <4285@eastman.UUCP>,
<1993Jan12.140109.5290@ke4zv.uucp>go.
Subject : Re: Tiny-2 to 2sat, help!

Better yet, contact ICOM directly for this information. They faxed me the
correct schematic and recommended parts list before I could even hang the
phone up. The schematic recommends use of a resistor and capacitor, values
of which I have don't have with me.

This works fine for my packet set-up.

The ICOM's office number I called was (206) 454-7619, though sometimes you
may have to wait a while for a technician to answer.

73,

Jerry, KC6TAY
--
~~~~~~
Jerry Bransford
Silicon Graphics
(619) 546-0409
~~~~~~

End of Packet-Radio Digest V93 #13
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